

Electronic Cigarette Use Among U.S. Adults, 2018

Maria A. Villarroel, Ph.D., Amy E. Cha, Ph.D., M.P.H., and Anjel Vahratian, Ph.D., M.P.H.

Key findings

Data from the National Health Interview Survey

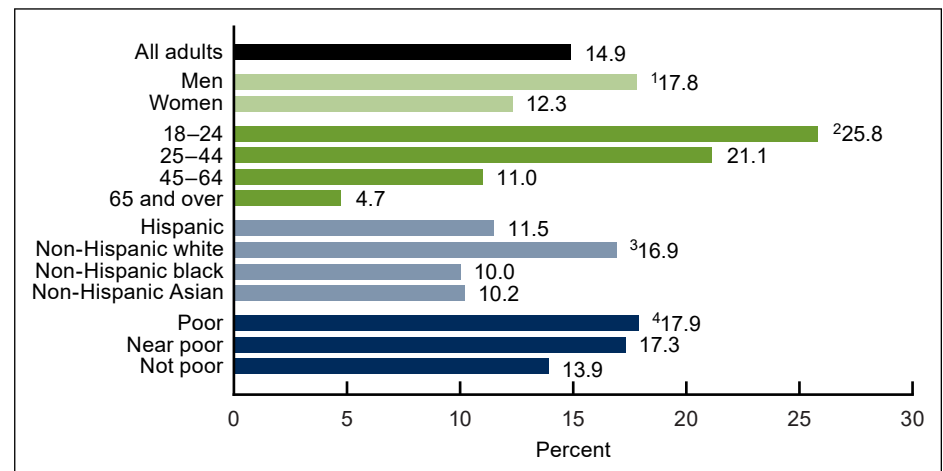
- In 2018, 14.9% of adults had ever used an electronic cigarette (e-cigarette), and 3.2% were current e-cigarette users.
- The prevalence of adults who had ever used an e-cigarette and were current users was highest among men, non-Hispanic white adults, and those aged 18–24.
- Comparing by cigarette smoking status, adults who quit smoking cigarettes within the past year were the most likely to have ever used (57.3%) and to be current (25.2%) e-cigarette users.

In 2018, an estimated 8.1 million U.S. adults were current electronic cigarette (e-cigarette) users (1). E-cigarette use is a public health concern (2), and it has been linked to a recent outbreak of lung injury and deaths among adults (3). Although the potential long-term health risks of e-cigarettes are not yet as well-known as they are with cigarettes, e-cigarettes usually contain nicotine, and nicotine is highly addictive (2). Moreover, the most common tobacco product combination among adults is e-cigarettes and cigarettes (4). This report examines e-cigarette use among U.S. adults aged 18 and over by selected sociodemographic characteristics and in relation to cigarette smoking status.

The percentage of adults who had ever used an e-cigarette varied by sociodemographic characteristics.

- In 2018, 14.9% of adults had ever used an e-cigarette (Figure 1).

Figure 1. Percentage of adults who had ever used an e-cigarette, by sex, age, race and Hispanic origin, and poverty status: United States, 2018



¹Significantly different from women ($p < 0.05$).

²Significant linear trend by age ($p < 0.05$).

³Significantly different from Hispanic, non-Hispanic black, and non-Hispanic Asian adults ($p < 0.05$).

⁴Significant linear trend by poverty status ($p < 0.05$).

NOTES: Adults were considered poor if their family income fell below 100% of the federal poverty level (FPL), near poor if their family income fell at or above 100% but below 200% of the FPL, and not poor if their family income fell at or above 200% of the FPL. Estimates are based on household interviews of a sample of the civilian noninstitutionalized U.S. population. Access data table for Figure 1 at: <https://www.cdc.gov/nchs/data/databriefs/db365-tables-508.pdf#1>.

SOURCE: NCHS, National Health Interview Survey, 2018.



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Centers for Disease Control and Prevention
National Center for Health Statistics

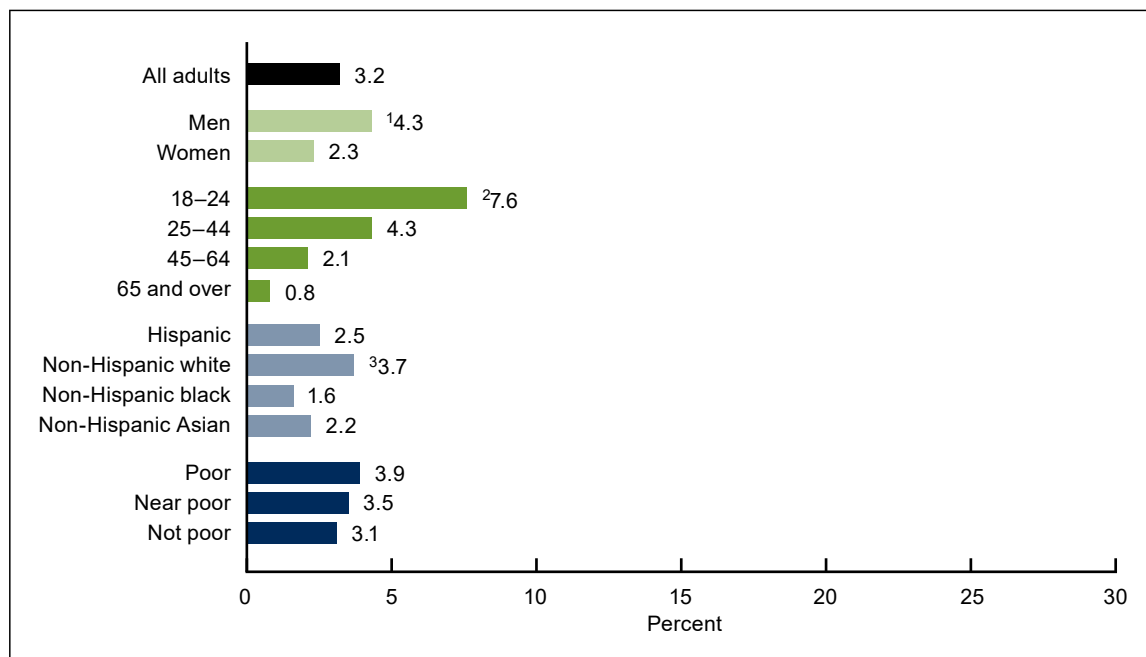


- Men (17.8%) were more likely than women (12.3%) to have ever used an e-cigarette.
- The percentage of adults who had ever used an e-cigarette decreased as age and income increased.
- Non-Hispanic white adults (16.9%) were more likely than Hispanic (11.5%), non-Hispanic black (10.0%), and non-Hispanic Asian (10.2%) adults to have ever used an e-cigarette.

The percentage of adults who were current e-cigarette users varied by sociodemographic characteristics.

- In 2018, 3.2% of adults were current e-cigarette users (Figure 2).
- Men (4.3%) were almost twice as likely as women (2.3%) to be current e-cigarette users.
- The percentage of adults who were current e-cigarette users decreased with age, from 7.6% among those aged 18–24, 4.3% among those aged 25–44, 2.1% among those 45–64, to 0.8% among those aged 65 and over.
- Non-Hispanic white adults (3.7%) were more likely than Hispanic (2.5%), non-Hispanic black (1.6%), and non-Hispanic Asian (2.2%) adults to be current e-cigarette users.
- Differences in current e-cigarette use by income were not significant.

Figure 2. Percentage of adults who were current e-cigarette users, by sex, age, race and Hispanic origin, and poverty status: United States, 2018



¹Significantly different from women ($p < 0.05$).

²Significant quadratic trend by age ($p < 0.05$).

³Significantly different from Hispanic, non-Hispanic black, and non-Hispanic Asian adults ($p < 0.05$).

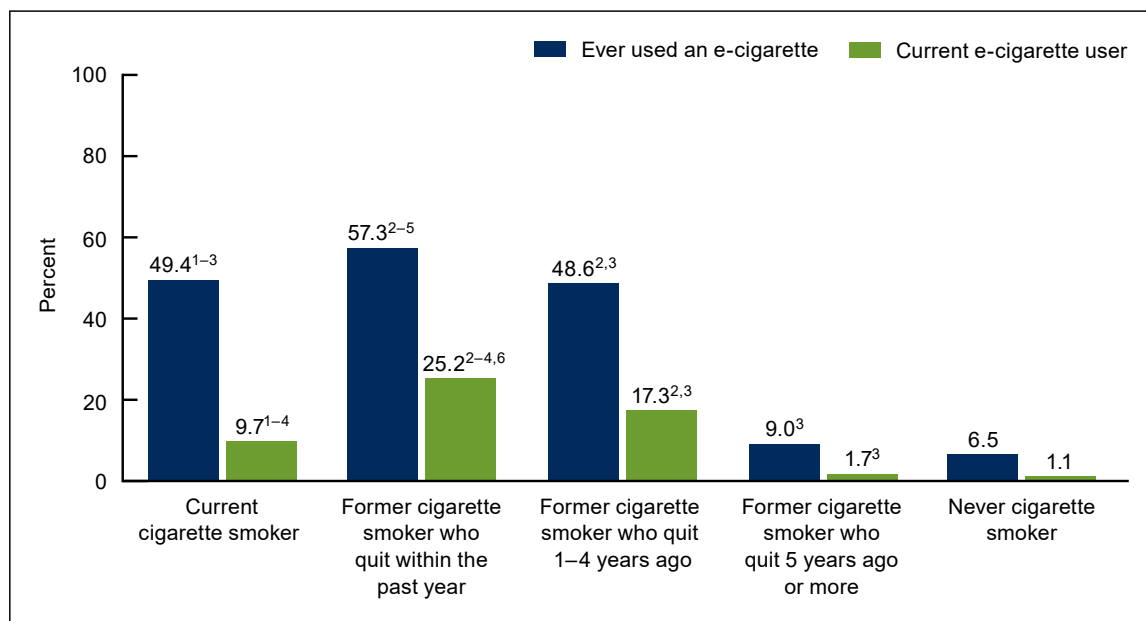
NOTES: Adults were considered poor if their family income fell below 100% of the federal poverty level (FPL), near poor if their family income fell at or above 100% but below 200% of the FPL, and not poor if their family income fell at or above 200% of the FPL. Estimates are based on household interviews of a sample of the civilian noninstitutionalized U.S. population. Access data table for Figure 2 at: <https://www.cdc.gov/nchs/data/databriefs/d365-tables-508.pdf#2>.

SOURCE: NCHS, National Health Interview Survey, 2018.

The percentages of adults who had ever used an e-cigarette and those who were current e-cigarette users varied by cigarette smoking status.

- The percentage of adults who had ever used an e-cigarette (57.3%) and the percentage of adults who were current e-cigarette users (25.2%) was highest among former cigarette smokers who quit within the past year (Figure 3). The percentage of adults who had ever used an e-cigarette or who were current e-cigarette users declined with a longer duration of quitting cigarettes among former smokers.
- The percentage of adults who had ever used an e-cigarette or who were current e-cigarette users was lowest among those who never smoked cigarettes (6.5% and 1.1%, respectively).
- The percentage of adults who were current e-cigarette users was lower for current cigarette smokers (9.7%) than for former cigarette smokers who quit within the past year (25.2%) and former cigarette users who quit 1–4 years ago (17.3%).

Figure 3. Percentage of adults who had ever used an e-cigarette and were current e-cigarette users, by cigarette smoking status: United States, 2018



¹Significantly different from former cigarette smokers who quit within the past year ($p < 0.05$).

²Significantly different from former cigarette smokers who quit 5 years ago or more ($p < 0.05$).

³Significantly different from never smokers ($p < 0.05$).

⁴Significantly different from former cigarette smokers who quit 1–4 years ago ($p < 0.05$).

⁵Significant quadratic trend by duration of quitting cigarette smoking among former smokers ($p < 0.05$).

⁶Significant linear trend by duration of quitting cigarette smoking among former smokers ($p < 0.05$).

NOTES: Estimates are based on household interviews of a sample of the civilian noninstitutionalized U.S. population. Access data table for Figure 3 at:

<https://www.cdc.gov/nchs/data/databriefs/db365-tables-508.pdf#3>.

SOURCE: NCHS, National Health Interview Survey, 2018.

Summary

In 2018, 14.9% of adults aged 18 and over had ever used an e-cigarette, and 3.2% of adults were current e-cigarette users. Those who had ever used an e-cigarette and those who were current users were more likely to be men compared with women, aged 18–24 compared with older ages, and non-Hispanic white adults compared with Hispanic, non-Hispanic black, or non-Hispanic Asian adults. The percentage of adults who had ever used an e-cigarette was highest among those who were poor, and decreased as income increased.

In 2018, 34 million U.S. adults were current smokers, and 55 million were former cigarette smokers for any duration (5). E-cigarette use was highest among current smokers and former smokers who quit cigarettes within the past year and those who quit 1–4 years ago. The percentages who had ever used an e-cigarette or who were current e-cigarette users declined among former smokers who had gone longer without smoking cigarettes and was lowest among those who never smoked cigarettes.

Definitions

E-cigarette use: “Ever used an e-cigarette” was based on a positive response to the survey question, “Have you ever used an e-cigarette, even one time?” Respondents were categorized as “Current e-cigarette users” based on the responses “every day” or “some days” to a follow-up question that asked, “Do you now use e-cigarettes every day, some days, or not at all?”

Cigarette smoking status: Based on the survey question, “Have you smoked at least 100 cigarettes in your entire life?” and a follow-up question that asked, “Do you now smoke cigarettes every day, some days, or not at all?” Adults who smoked every day or some days were classified as “current cigarette smokers.” For those who do not smoke at all, a follow-up question asked, “How long has it been since you quit smoking?” These former cigarette smokers were classified into “quit within the past year,” “quit 1–4 years ago,” and “quit 5 years ago or more.” Adults who had not smoked 100 cigarettes in their lifetime were classified as “never smokers.”

Race and Hispanic origin: Based on responses to two questions that determine Hispanic or Latino origin and race. Persons of Hispanic or Latino origin may be of any race. Non-Hispanic white, non-Hispanic black, and non-Hispanic Asian refer to persons with a single race group.

Poverty status: Categories were based on the ratio of a family’s income in the previous calendar year to the appropriate poverty threshold (given the family’s size and number of children), as defined by the U.S. Census Bureau. The 2018 National Health Interview Survey (NHIS) imputed income files were used to allow for imputed values when family income was not provided. Adults were considered poor if their family income fell below 100% of the federal poverty level (FPL), near poor if their family income fell at or above 100% but below 200% of the FPL, and not poor if their family income fell at or above 200% of the FPL.

Data source and methods

Data from the 2018 NHIS were used for this analysis. NHIS is a nationally representative, household survey of the civilian noninstitutionalized U.S. population. It is conducted continuously throughout the year by the National Center for Health Statistics (NCHS). Questions about e-cigarette use were introduced in the 2014 NHIS (6). Data for this analysis come from the Family and Sample Adult components of NHIS. For more information about NHIS, visit its website at: <https://www.cdc.gov/nchs/nhis.htm>.

Point estimates and the corresponding variances were calculated using SAS-callable SUDAAN version 11.0 (RTI International, Research Triangle Park, N.C.) to account for the complex sample design of NHIS. Linear and quadratic trends by age and poverty status were evaluated using the POLY function in SUDAAN's PROC DESCRIPT. Trends and differences between percentages were evaluated using two-sided significance tests at the 0.05 level. All estimates presented meet NCHS data presentation standards for proportions (7).

References

1. Creamer MR, Wang TW, Babb S, Cullen KA, Day H, Willis G, et al. Tobacco product use and cessation indicators among adults—United States, 2018. *MMWR Morb Mortal Wkly Rep* 68(45):1013–19. 2019. Available from: <https://dx.doi.org/10.15585/mmwr.mm6845a2>.
2. National Center for Chronic Disease Prevention and Health Promotion. E-cigarette use among youth and young adults. A report of the Surgeon General. 2016. Available from: https://e-cigarettes.surgeongeneral.gov/documents/2016_SGR_Full_Report_non-508.pdf.
3. National Center for Chronic Disease Prevention and Health Promotion. Outbreak of lung injury associated with the use e-cigarette, or vaping, products. Available from: https://www.cdc.gov/tobacco/basic_information/e-cigarettes/severe-lung-disease.html#latest-outbreak-information.
4. Wang TW, Asman K, Gentzke AS, Cullen KA, Holder-Hayes E, Reyes-Guzman C, et al. Tobacco product use among adults—United States, 2017. *MMWR Morb Mortal Wkly Rep* 67(44):1225–32. 2018. Available from: <https://www.cdc.gov/mmwr/volumes/67/wr/mm6744a2.htm>.
5. Villarroel MA, Blackwell DL, Jen A. Tables of summary health statistics for U.S. adults: 2018 National Health Interview Survey. National Center for Health Statistics. 2019. Available from: https://ftp.cdc.gov/pub/Health_Statistics/NCHS/NHIS/SHS/2018_SHS_Table_A-12.pdf.
6. Schoenborn CA, Gindi RM. Electronic cigarette use among adults: United States, 2014. NCHS Data Brief, no 217. Hyattsville, MD: National Center for Health Statistics. 2015. Available from: <https://www.cdc.gov/nchs/data/databriefs/db217.pdf>.
7. Parker JD, Talih M, Malec DJ, Beresovsky V, Carroll M, Gonzalez Jr. JF, et al. National Center for Health Statistics data presentation standards for proportions. National Center for Health Statistics. *Vital Health Stat* 2(175). 2017. Available from: https://www.cdc.gov/nchs/data/series/sr_02/sr02_175.pdf.

**U.S. DEPARTMENT OF
HEALTH & HUMAN SERVICES**

Centers for Disease Control and Prevention
National Center for Health Statistics
3311 Toledo Road, Room 4551, MS P08
Hyattsville, MD 20782-2064

FIRST CLASS MAIL
POSTAGE & FEES PAID
CDC/NCHS
PERMIT NO. G-284

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, \$300

For more NCHS Data Briefs, visit:
<https://www.cdc.gov/nchs/products/databriefs.htm>.



NCHS Data Brief ■ No. 365 ■ April 2020

Keywords: vaping • e-cigarette • tobacco • National Health Interview Survey

Suggested citation

Villaruel MA, Cha AE, Vahratian A.
Electronic cigarette use among U.S. adults,
2018. NCHS Data Brief, no 365. Hyattsville,
MD: National Center for Health Statistics.
2020.

Copyright information

All material appearing in this report is in
the public domain and may be reproduced
or copied without permission; citation as to
source, however, is appreciated.

**National Center for Health
Statistics**

Jennifer H. Madans, Ph.D., *Acting Director*
Amy M. Branum, Ph.D., *Acting Associate
Director for Science*

Division of Health Interview Statistics

Stephen J. Blumberg, Ph.D., *Director*
Anjel Vahratian, Ph.D., M.P.H., *Associate
Director for Science*

For e-mail updates on NCHS publication
releases, subscribe online at:
<https://www.cdc.gov/nchs/govdelivery.htm>.

For questions or general information
about NCHS:
Tel: 1-800-CDC-INFO (1-800-232-4636)
TTY: 1-888-232-6348
Internet: <https://www.cdc.gov/nchs>
Online request form: <https://www.cdc.gov/info>

ISSN 1941-4927 Print ed.
ISSN 1941-4935 Online ed.
DHHS Publication No. 2020-1209
CS316197